

Noble metal nanoparticles impregnated into zeolites for ethanol oxidation reaction in alkaline medium

A.A.El-Shafei

Department of Chemistry, Mansoura University, Egypt

Abstract

Nowadays, the direct ethanol fuel cell (DEFC) with the electro-oxidation of ethanol as its anode reaction is becoming a promising green power source for portable device applications owing to its advantages of higher open circuit voltage, high current density, safer fuel and easy to handle compared to Hydrogen.

In spite of the research effort to find out a cheap anode with high performance for fuel cell application, expensive noble metals are still in use. For this reason, more effort must be devoted to reduce the amount of noble metal loading while the high reactivity is still retained. In order to fulfill this demand, high dispersion of noble metal-containing catalyst on different cheap and conducting substrates has been extensively studied.

In this work, noble metal nanoparticles dispersed in zeolites layer have been prepared, by loading the Zeolites layer onto graphite substrate using drop casting technique, followed by impregnation into metal salt solution, and then tested for ethanol oxidation in alkaline solution using cyclic voltammetry and

chronoamperometry techniques. Finally, The catalyst layer morphology examined by electron microscopy

Biography

Dr. A.A. El-Shafei, Science Doctor (Ph.D.-Chemistry), he became a full Professor of Physical Chemistry at Mansoura University in October 2001. He got his B Sc in chemistry, M Sc in Physical Chemistry and Specialist in electro-chemistry, Doctor's degree (Ph.D.) under channel system program (Bonn University, Germany & Mansoura University, Egypt). Dr. El-Shafei acts as active participants in various electrochemist groups in Germany, Japan, France and USA. In 1994 he spent 6 months as a research associate at CNRS, France. He got various research fellowships from distinguished scientific organizations such as, AxVH, JSPS and JICA. Dr. El-Shafei got the Arab Fund for Economic & Social Development research award in 2006. He got the Prize of Distinction in chemistry from Mansoura University, 1998/1999. Currently Dr. El-Shafei's researches focus on modified electrodes for fuel cell technology and corrosion inhibition.

Citation : A.A.El-Shafei, Department of Chemistry, Mansoura University, Egypt; speaker at 3rd Global Congress on Polymer Chemistry Biopolymers; Mar 22-23, 2021; Dubai, UAE